



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/631,899	08/01/2003	Gregory L. Cannon	1823.0680001	9805
26111	7590	11/02/2004	EXAMINER	
STERNE, KESSLER, GOLDSTEIN & FOX PLLC 1100 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			KIM, CHONG R	
			ART UNIT	PAPER NUMBER
			2623	

DATE MAILED: 11/02/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/631,899

Applicant(s)

CANNON ET AL.

Examiner

Charles Kim

Art Unit

2623

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 June 2004.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-49 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 35-49 is/are allowed.
- 6) ☒ Claim(s) 1,7-15,21,22 and 28-34 is/are rejected.
- 7) ☒ Claim(s) 2-6,16-20 and 23-27 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 01 August 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Response to Amendment and Arguments

1. Applicant's amendment filed on June 28, 2004 has been entered and made of record.
2. Applicant's arguments have been fully considered, but they are not deemed to be persuasive for at least the following reasons.

Applicants argue (page 18) that "Twabar is a width of a rectangular box between two points of interest, not a hysteresis band as recited in claim 1". The Examiner responds by pointing out that the Bolle reference should be considered as a whole. In this case, Bolle clearly discloses a hysteresis band in col. 7, lines 17-27 and shows an illustration of the band in figure 7B.

Applicants further argue (page 18) that "nowhere does Bolle teach or suggest counting a number of crossings of the determined hysteresis band while traversing a pixel path, as recited in claim 1". The Examiner disagrees. Bolle explains that the process traverses the fingerprint image along a roughly rectangular bar (hysteresis band) joining two points (col. 7, lines 17-22), wherein the ridge count between the two points are determined based on the number of transitions from a receptive to non-receptive state resulting from the traversing of the rectangular bar (col. 8, lines 13-17). Note that the number of transitions from a receptive to non-receptive state is equivalent to the number of crossings (see col. 8, lines 1-12).

Claim Objections

3. Claims 2, 16, and 23 are objected to under 37 CFR 1.75 as being a substantial duplicate of claims 35, 40, and 45 respectively. When two claims in an application are duplicates or else are so close in content that they both cover the same thing, despite a slight difference in wording, it is proper after allowing one claim to object to the other as being a substantial duplicate of the allowed claim. See MPEP § 706.03(k).

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1, 11-13, 15, 22, 29-31 are rejected under 35 U.S.C. 102(b) as being anticipated by Bolle et al., U.S. Patent No. 6,111,978 (“Bolle”).

Referring to claim 1, Bolle discloses a method for counting print ridges in a captured print image frame, comprising the steps of:

- a. traversing a pixel path through the captured print image frame (col. 7, lines 17-22)
- b. determining a hysteresis band for the pixel path (col. 7, lines 22-27. Note that the “Twbar” is interpreted as being analogous to the hysteresis band)
- c. counting a number of crossings of the determined hysteresis band while traversing the pixel path (col. 6, lines 44-53 and col. 7, lines 17-27)

Art Unit: 2623

d. determining a number of print ridges based on the counted number of hysteresis band crossings (col. 6, lines 44-53 and col. 7, lines 17-27).

Referring to claim 11, Bolle discloses a method for counting fingerprint ridges, comprising the steps of:

- a. identifying a region of interest in a stored fingerprint image frame (col. 5, lines 11-16)
- b. determining a pixel path through the region of interest (col. 6, line 54-col. 7, line 16)
- c. traversing the determined pixel path (col. 7, lines 17-22)
- d. determining a hysteresis band for the determined pixel path (col. 7, lines 22-27).

Note that the "Twbar" is interpreted as being analogous to the hysteresis band)

- e. counting a number of crossings of the determined hysteresis band while traversing the determined pixel path (col. 6, lines 44-53 and col. 7, lines 17-27)
- f. determining a number of fingerprint ridges based on the counted number of hysteresis band crossings (col. 6, lines 44-53 and col. 7, lines 17-27)
- g. storing the number of fingerprint ridges determined in step (f) [col. 8, lines 28-30.

Note that the number of ridge counted is stored in order to be used for matching fingerprints].

Referring to claim 12, Bolle further discloses the steps of capturing a fingerprint image and storing the captured fingerprint image to be accessed as the stored fingerprint image frame (col. 4, lines 36-46).

Referring to claim 13, Bolle further discloses the step of evaluating the stored number of fingerprint ridges to determine a quality of the captured fingerprint image (col. 8, lines 17-21).

Art Unit: 2623

Referring to claim 15, see the rejection of at least claim 13 above.

Referring to claim 22, see the rejection of at least claim 1 above.

Referring to claim 29, Bolle further discloses a camera that captures a fingerprint image and outputs the captured fingerprint image frame (col. 4, lines 36-46).

Referring to claim 30, Bolle further discloses a memory that stores the captured fingerprint image frame, and is accessible by the ridge counter module (col. 4, lines 36-46).

Referring to claim 31, Bolle further discloses a platen (580) that has a finger application area (col. 4, lines 36-46 and figure 5).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7, 21 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Bolle et al., U.S. Patent No. 6,111,978 ("Bolle") and Wheatley, et al., PCT Publication No. WO 87/06378 ("Wheatley").

Referring to claim 7, Bolle does not explicitly disclose that the number of print ridges is determined by dividing the counted number of hysteresis band crossings by two. However, this feature was exceedingly well known in the art. For example, Wheatley discloses the step of dividing the number of crossings of a pixel path by two to determine the number of fingerprint ridges (page 10, lines 3-23 and figure 3).

Bolle and Wheatley are both concerned with counting the number of print ridges in a fingerprint image. Wheatley provides an enhanced fingerprint imaging system that derives sufficient information to characterize a particular fingerprint and distinguish from all others, while being robust to normal variations in a particular print due to dirt or damage such as cuts (Wheatley, page 6, lines 13-17). Therefore, it would have been obvious to include the teachings of Wheatley in the method of Bolle in order to enhance the ridge counting process.

Referring to claims 21 and 28, see the rejection of at least claim 7 above.

6. Claims 8-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Bolle et al., U.S. Patent No. 6,111,978 ("Bolle") and Gange et al., U.S. Patent No. 6,212,290 ("Gange").

Referring to claim 8, Bolle does not explicitly disclose traversing a second pixel path across the captured print image frame. However, this feature was exceedingly well known in the art. For example, Gange discloses the steps of traversing a first pixel path and counting the number of ridges crossing the path, and traversing a second pixel path across the captured print image frame (col. 10, line 49-col. 11, line 19 and figure 14).

Bolle and Gange are both concerned with counting the number of print ridges in a fingerprint image. Bolle explains that it is possible for the selected pixel path to be considered invalid, thereby requiring the traversal of a different pixel path (Bolle, col. 7, lines 64-67). Gange provides multiple pixel paths for traversal that allows a different pixel path to be traversed in case a selected pixel path is considered invalid (Gange, figure 14). Therefore, it would have been obvious to include the multiple pixel paths of Gange, in the method of Bolle, in order to

Art Unit: 2623

traverse a different pixel path in case a first pixel path is determined to be invalid, thereby allowing an accurate ridge count measurement to be obtained from a valid pixel path.

Referring to claim 9 see the rejection of at least claim 8 above. Bolle does not explicitly disclose the step of determining a second hysteresis band. However, Bolle explains that the hysteresis band can selected to be in the range of 3 to 5 pixels (col. 7, lines 22-27). Bolle also explains that it is possible for a selected pixel path and hysteresis band to be considered invalid (col. 7, lines 64-67). Therefore, it would have been obvious to determine a second hysteresis band in the case where the first hysteresis band is considered to be invalid, in order to obtain an accurate ridge count measurement from a valid hysteresis band, thereby enhancing the robustness of the ridge counting process.

Referring to claim 10, see the rejection of at least claim 9 above.

7. Claims 14, 32-34 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bolle et al., U.S. Patent No. 6,111,978 ("Bolle").

Referring to claim 14, Bolle does not explicitly disclose the step of repeating steps (b)-(g) at least one additional time. However, Bolle explains that it is possible for a selected pixel path and hysteresis band to be considered invalid (col. 7, lines 64-67). Therefore, it would have been obvious to repeat steps (b)-(g) at least one additional time in the case where the first pixel path and hysteresis band are considered to be invalid, in order to obtain an accurate ridge count measurement from a valid pixel path and hysteresis band, thereby enhancing the robustness of the ridge counting process.

Art Unit: 2623

Referring to claim 32, Bolle discloses an imaging subsystem for obtaining an image of the fingerprint (col. 4, lines 36-40), but does not explicitly disclose an illumination source that provides light to illuminate the finger application area to produce the fingerprint image.

However, Official notice is taken that an illumination source for obtaining an image of a fingerprint was exceedingly well known in the art. Therefore, since Bolle explains that any other known means can be used to enter the fingerprint image (col. 4, lines 43-45), it would have been obvious to include an illumination source in the imaging system of Bolle, in order to obtain an accurate fingerprint image.

Referring to claim 33, see the rejection of at least claim 32 above.

Referring to claim 34, see the rejection of at least claim 32 above. Bolle further discloses a controller (510) that includes the ridge counter module (figure 5).

Allowable Subject Matter

8. Claims 35-49 are allowed.
9. Claims 2-6, 16-20, 23-27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Art Unit: 2623

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Charles Kim whose telephone number is 703-306-4038. The examiner can normally be reached on Mon thru Thurs 8:30am to 6pm and alternating Fri 9:30am to 6pm.


If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on 703-308-6604. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2623

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


ck

October 26, 2004


Jon Chang
Primary Examiner